



16596199
Edition 2
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Air Drill

33 Series

Maintenance Information



Save These Instructions

IR *Ingersoll Rand*[®]

Product Safety Information

WARNING

- Failure to observe the following warnings, and to avoid these potentially hazardous situations, could result in death or serious injury.
- Read and understand this and all other supplied manuals before installing, operating, repairing, maintaining, changing accessories on, or working near this product.
- Always wear eye protection when operating or performing maintenance on this tool. The grade of protection required should be assessed for each use and may include impact-resistant glasses with side shields, goggles, or a full face shield over those glasses.
- Always turn off the air supply, bleed the air pressure and disconnect the air supply hose when not in use, before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool or any accessory.

Note: When reading the instructions, refer to exploded diagrams in parts Information Manuals when applicable (see under Related Documentation for form numbers).

Maintenance Tools

| Tool Name | Operation | Tool Number for Ordering |
|--|---|--------------------------|
| Packing Nut Spanner Wrench | Tightening or loosening the Spindle Nut (115), (Part Number R3H-15). | R3H-26 |
| Packing Nut Spanner Wrench | Tightening or Loosening the Spindle Nut (115 or 215) Part Number R3H4-15 and R44SM51-15) | T1SE-59 |
| Grease Gun | Inserting grease into the Backhead (15, 210) and Gear Case (102, 212). | P25-228 |
| Throttle Valve Puller and Lapping Tool | Removing the All-Steel Throttle Valve (70) from the Throttle Body. Also used as a tool for lapping the All-Steel Throttle Valve to the valve seat in the Throttle Body. | T01-371 |
| Planet Gear Frame Set Screw Wrench (5/32" hexagon) | Tightening or loosening the Planet Gear Frame Set Screws (86) in the Planet Gear Frame (85). | 4U-478 |

Lubrication

Each time the Models 33H, 33H-EU, 33J, 33J-EU, 33SJ, 33SJ-EU, 33SKA, 33SKA-EU, 33SMA and 33SMA-EU Drills and Models 33H51, 33H51-EU, 33J51, 33J51-EU, 33SK51, 33SK51-EU, 33SM51 and 33SM51-EU Motors are disassembled for maintenance, repair or replacement of parts, lubricate as follows:

1. Work 1-2 cc of **Ingersoll Rand** No.28 Grease through the Grease Fitting (16, 103 or 213).
2. Remove the Oil Chamber Plug (19, 211) and fill the chamber in the Backhead (15, 210) with **Ingersoll Rand** No. 50 Oil.
3. Inject 2 or 3 drops of **Ingersoll Rand** No. 50 Oil into the hole in the Throttle Sleeve (63, 236).

Disassembly

General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members and housings.
3. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
4. Do not disassemble the tool unless you have a complete set of new gaskets and O-rings for replacement.

Disassembly of the Tool

1. Keep the Air Strainer Screen (67) clean. Periodically, as experience indicates, unscrew the Air Strainer Body (69) from the Air Strainer Cap (66) and wash the Air Strainer Screen in a clean, suitable, cleaning solution. Push the prongs on the Screen Support (68) into one of the Screen and insert the screen end first, into the body when assembling the strainer.

NOTICE

The external thread on the Outer Feed Screw (43) or Motor Mounting Stud (217) is left-hand.

2. Rotate the Feed Screw Cap (72) or Motor Mounting Stud Cap (218) clockwise to remove.
3. Do not pry the Backhead (115, 210) from the Motor Housing (1, 200, 202). Grasp the Oil Chamber Plug (19, 211) in a copper-covered or leather-covered vise jaws and pull on the Housing if the Backhead cannot be lifted off with the fingers.

NOTICE

The Governor Assembly (27) has left-hand threads.

4. Rotate the Governor Assembly clockwise to remove it.
5. Never clamp the Cylinder (41) in a vise. When disassembling the Motor:
 - a. Grasp the Cylinder in one hand.
 - b. Insert a small rod into the rotor bore and drive the hub on the Rotor out of the Rear Rotor Bearing (36).
 - c. Support the Front End Plate (39) and press the rotor front hub out of the Front Rotor Bearing (37).
6. Remove the Throttle Body Set Screw (52) or Forward Inlet Stud Set Screw (204) from the side of the Motor Housing before attempting to pull the Throttle Body (55) or Forward Inlet Stud (203) from the Motor Housing.

For Drills and Motors with Planetary Gearing.

Unscrew the three Planet Gear Frame Set Screws (86) from the Planet Gear Frame (85) before attempting to press the Spindle out of the Planet Gear Frame.

Assembly

General Instructions

1. Always press on the **Inner** ring of a ball-type bearing when installing the bearing on a shaft.
2. Always press on the **outer** ring of a ball-type bearing when pressing the bearing into a bearing recess.
3. Unless otherwise noted, always press on the stamped end of a needle bearing when installing the needle bearing in a recess.
4. Whenever grasping a tool or part in a vise, always use leather-covered or copper-covered vise jaws. Take extra care with threaded parts and housings.
5. Always clean every part and wipe every part with a thin film of oil before installation.
6. Apply a film of O-ring lubricant to all O-rings before final assembly.
7. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in a clean, suitable, cleaning solution and dry with a clean cloth. **Sealed or shielded bearing should never be cleaned.** Work grease thoroughly into every open bearing before installation.

Assembly of the Tool

1. Press the Rear Rotor Bearing (36), shielded side first, into the recess in the Rear End Plate (38) with an arbor that will contact only the bearing outer race. Press on the bearing inner race when installing the assembly on the hub of the Rotor (33).
2. Press the Front Rotor Bearing (37), shielded side first, onto the front hub of the Rotor with a sleeve that will clear the pinion and contact only the bearing inner race.
3. After installing one End Plate and Rotor Bearing on the rotor hub, insert a Vane (40) into each slot in the Rotor. Place the Cylinder (41) over the Rotor and against the installed End Plate being sure the Cylinder is positioned with its flattened rim toward the pinion end of the Rotor so that the flats will coincide with those on the Front End Plate when the motor is assembled.

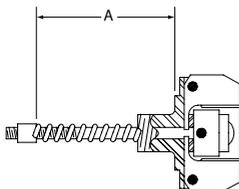
NOTICE

The Governor Assembly (27) has left-hand threads.

4. When installing a new Governor Assembly, screw the Adjusting Nut onto the governor stem until the proper dimension "A" as shown in Dwg.TPD497. This will usually result in the proper governed free speed. However, this is only an approximate setting and further adjustment may be necessary. Screw the nut farther onto the stem to increase the speed; back it off to decrease the speed.

Governor Adjustment

A=1-29/32" (48 mm) For Drills and Motors with Standard Throttle
A=1-1/32" (52 mm) For Motors with Remote Control



(Dwg. TPD497)

The correct governed free speeds for these Models are:

| Model | Speed rpm |
|--|-----------|
| 33H, 33H-EU, 33H51 and 33H51-EU | 800 |
| 33J, 33J-EU, 33SJ, 33SJ-EU, 33J51 and 33J51-EU | 450 |
| 33SKA, 33SKA-EU, 33SK51 and 33SK51-EU | 300 |
| 33SM, 33SM-EU, 33SM51 and 33SM51-EU | 185 |

5. Be sure both rubber Air Port Gaskets (8) are in good condition and are positioned, lip side first, in the air ports in the Motor Housing (1, 200, 202) before installing the Multi-Vane motor in the Motor Housing.
6. Draw the Backhead (15) evenly against the Backhead Gasket (14) on the face of the Motor Housing by turning each Backhead Cap Screw (22, 23) a little at a time until all are tight.

NOTICE

The two sets of Housing Studs, Nut and Lock Washer have been replaced by two Backhead Short Cap Screws (22) using Copper Washers (24A).

7. If the Housing Studs need replacing in an old Motor Housing, order two Backhead Short Cap Screws R3H-57 and two Copper Washers DLC-504B.
8. Note the stamping "THRUST HERE" on one side of the Spindle Thrust Bearing (92). Install the Bearing unstamped side first on the spindle hub.

For Drill and Motors with Spur Gearing

Install an Intermediate Gear Bearing (96) at each end of the Intermediate Gear (95). Mesh the small gear of the compound Intermediate Gear with the gear on the Spindle (81, 208) and install the Spindle Assembly and Intermediate Gear simultaneously in either the Gear Case (102, 212) or the Motor Housing (1, 200 or 202).

For Drills and Motors with Spur Gearing

Assemble the Spindle (81 or 208) and gearing in the Gear Case (102) and Gear Case Cover (113 or 214). Install this assembly as a unit on the Motor Housing.

Troubleshooting Guide

| Trouble | Probable Cause | Solution |
|-----------------------------|---|---|
| Low power or low free speed | Dirty Inlet Bushing or Air Strainer Screen and/ or Muffler Screen | Using a clean, suitable, cleaning solution in a well-ventilated area, clean the Air Strainer Screen and Muffler Screen. Allow to air dry. |
| | Worn or broken Vanes | Replace complete set of Vanes. |
| | Worn or broken Cylinder and/or scored EndPlates | Examine Cylinder and replace it if it is worn or broken or if bore is scored or wavy. Replace End Plates if they are scored. |
| | Dirty motor parts | Disassemble the tool and clean all parts with a clean, suitable, cleaning solution, in a wellventilated area. Reassemble the tool as instructed in this manual. |
| | Improper positioning of Reverse Valve | Make certain Reverse Valve is fully engaged. |
| Motor will not run | Incorrect assembly of motor | Disassemble motor, replace worn or broken parts and reassemble as instructed. |
| Rough operation | Worn or broken Rear Rotor Bearing or Front Rotor Bearing | Examine each bearing. Replace if worn or damaged. |
| | Worn or broken Gear teeth | Check for a worn or broken gearing or if a replacement is necessary. |
| | Oil Chamber Plug worn or not tight | Tighten the Plug. If the problem persists, replace the Plug. |
| Air Leaks | Worn Throttle Valve Face or Throttle Valve Face Cap | Replace worn parts. |
| | Oil Chamber Plug worn or not tight | Tighten the Plug. If the problem persists, replace the Plug. |
| Gear Case gets hot | Insufficient Grease | Clean and inspect Gear Case gearing parts and lubricate as instructed in Lubricaton . |
| | Worn or damaged parts | Clean and inspect the Gear Case and gearing. Replace worn or broken components. |

Related Documentation

For additional information refer to:

Product Safety Information Manual 04580353.

Product Information Manual 16598039.

Parts Information Manual 03523008.

Manuals can be downloaded from ingersollrandproducts.com

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